AXIS 3D People Counter

User Manual

AXIS 3D People Counter
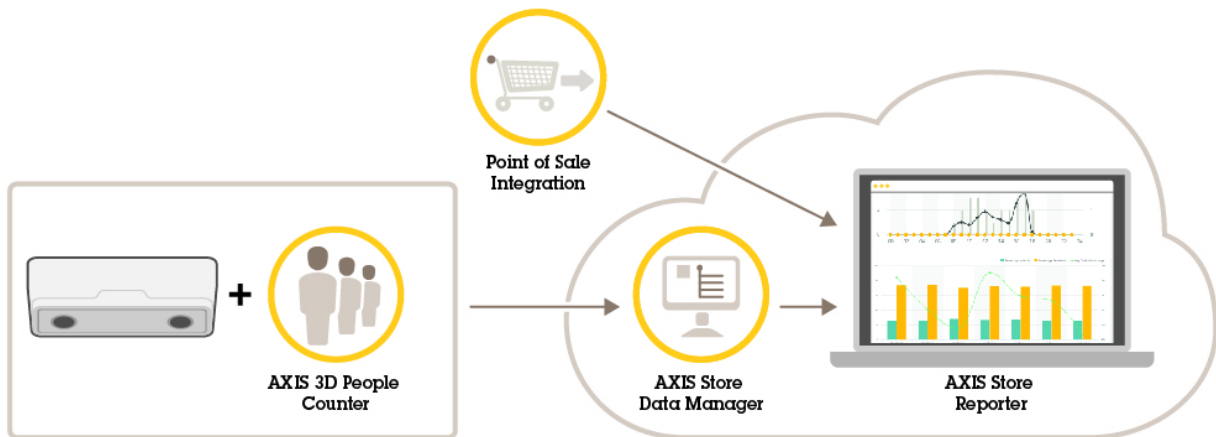
Table of Contents

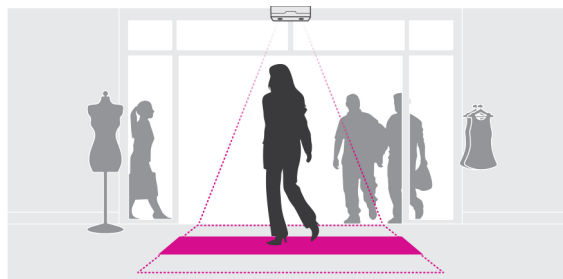# AXIS 3D People Counter

Solution overview

An overview of the different devices, applications, and tools needed for a complete system.

AXIS 3D People Counter

AXIS 3D People Counter is an analytic application that can be installed on a network camera.

The counter is embedded in the camera which means you do not need a dedicated computer to run the application. AXIS 3D People Counter is intended for retail environments, like stores or shopping malls, or other environments where you want to count people.

What's the difference between AXIS People Counter and AXIS 3D People Counter?

The applications have two different algorithms for counting people which makes them suitable for different environments:

- AXIS People Counter recognizes objects moving in the field of view and identifies them as people due to their overall size and movement. AXIS People Counter is suitable for most scenarios, covering single as well as double door entrances.

AXIS 3D People Counter

Solution overview
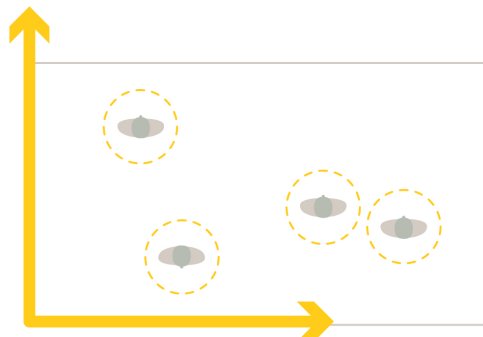
- AXIS 3D People Counter calculates the depth within the field of view in order to measure the height and the size of the object. AXIS 3D People Counter is suitable for crowded scenarios and scenes with challenging light conditions like strong sunlight, glares and shadows.

AXIS 3D People Counter

How to mount the camera

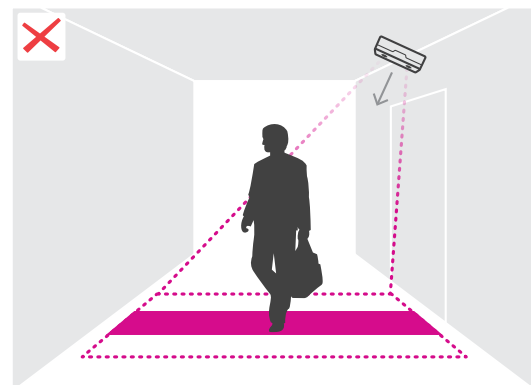In addition to the instructions in the camera's Installation Guide, there are some important steps to follow for the application to behave in the expected way:

- The camera must be mounted straight above the point where people pass.
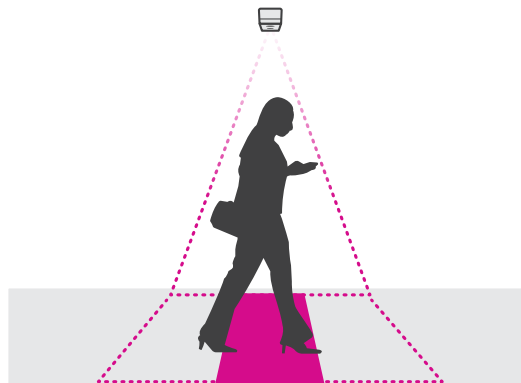
- Make sure the camera is facing straight down, in line with the ceiling.
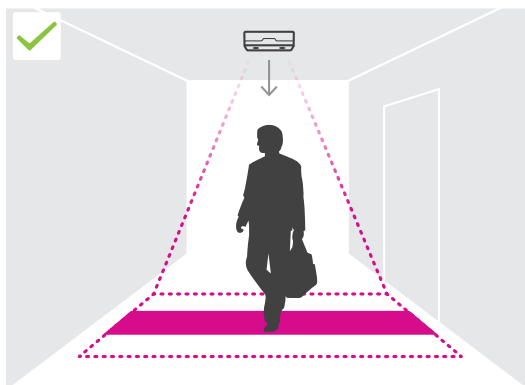
- Make sure there is sufficient white light on site.

- Make sure there are no moving objects interfering in the counting area. For example, do not install the camera too close to a door.
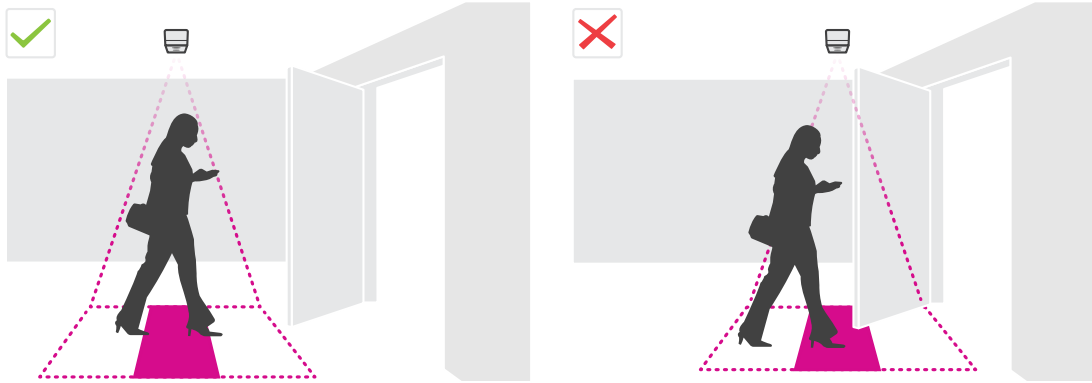
- Loitering people or large plants that sway slightly could interfere with the counting.
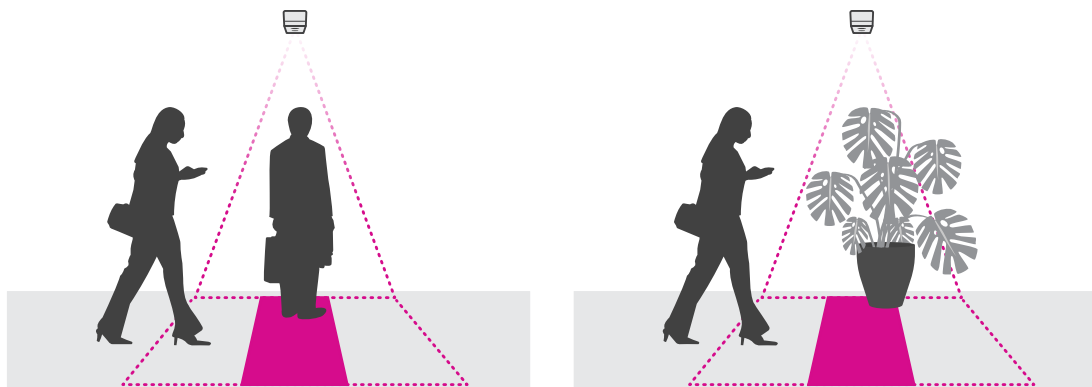
Mounting height and coverage

The tables show the width that can be covered by a camera at a given mounting height. The width of the counting area is different if people can go in and out in the left and right direction.

Ceiling height (cm)	Counting area width — not using left and right (cm)	Counting area width — using left and right (cm)
240	172	83
260	203	119
280	234	153
300	266	188
320	297	221
340	328	254
360	360	288
380	385	314
400	363	293

How to mount the camera

Ceiling height (in)	Counting area width — not using left and right (in)	Counting area width — using left and right (in)
95	68	34
102	80	47
110	92	61
118	105	75
126	117	88
134	129	100
142	142	114
147	152	124
158	143	116

Counting area width not using left and right.

Counting area width using left and right

Find the device on the network

To find Axis devices on the network and assign them IP addresses in Windows®, use AXIS IP Utility or AXIS Device Manager. Both applications are free and can be downloaded from *axis.com/support*.

For more information about how to find and assign IP addresses, see the document *How to assign an IP address and access your device* on the device page at *axis.com*.

Access the device

1. Open a browser and enter the IP address or host name of the Axis device.

    If you have a Mac computer (OS X), go to Safari, click Bonjour and select the device from the drop-down list. To add Bonjour as a browser bookmark, go to **Safari > Preferences**.

    If you do not know the IP address, use AXIS IP Utility or AXIS Device Manager to find the device on the network.

2. Enter the username and password. If you access the device for the first time, you must set the root password. See *Set a secure password for the root account on page 9* .

3. The live view page opens in your browser.

Secure passwords

Important

> Axis devices send the initially set password in clear text over the network. To protect your device after the first login, set up a secure and encrypted HTTPS connection and then change the password.

The device password is the primary protection for your data and services. Axis devices do not impose a password policy as they may be used in various types of installations.

To protect your data we strongly recommend that you:

*   Use a password with at least 8 characters, preferably created by a password generator.
*   Don't expose the password.
*   Change the password at a recurring interval, at least once a year.

Set a secure password for the root account

Important

> The default administrator username is **root**. If the password for root is lost, reset the device to factory default settings.

1. Type a password. Follow the instructions about secure passwords. See *Secure passwords on page 9* .

2. Retype the password to confirm the spelling.

3. Click **Create login**. The password has now been configured.

Install the application on the camera

Note

*   The license is only valid for one camera. You cannot activate the license on another camera without a new registration key.
*   To install applications on the camera you need administrator rights.

AXIS 3D People Counter

Find the device on the network

1. Install the camera on your network..

2. Go to the camera's webpage in your browser, see the User Manual for the camera.

3. Go to **Setup > Applications** .

4. If there are other applications installed on the camera, remove them.

5. Upload the application file (.eap) to the camera.

6. Click the link under **Applications > AXIS 3D People Counter > Settings**.

7. Activate the license. If you're online, enter the license code. The application automatically activates the license.

8. Calibrate the counter. See *How to calibrate the counter on page 12*

How to activate the license when you're offline

To activate the license when you're offline, you need a license key. If you don't have a license key on the computer, do the following:

1. Go to *www.axis.com/applications*

2. Go to **License key registration**. You need the license code and the Axis device serial number.

3. Save the license key file on the computer and select the file when the application asks for it.

How to access the application settings

To access the application's webpage:

- In the camera's webpage, go to **Setup > Application > AXIS 3D People Counter** and click the **AXIS 3D People Counter settings** link.

- In a browser, type `[deviceIP]/stereo`.

Setup

How to set date and time

The date and time settings are important for your camera to keep the correct time for a longer period of time, and for the statistics to be attributed to the correct time.

You need to set the time in the camera's webpage, and select the time zone in the application.

1. In the camera's webpage, go to **Setup > System Options > Date & Time**.

2. In the application, go to **Settings > General** and select the correct time zone.

How to set up a user account

In the camera you can set up different account privileges so that unauthorized personnel can view statistics but not change any settings of the counter.

1. To set up a user account, go to the camera's webpage.

2. Go to **Setup > System Options > Security > Users**.

3. For detailed instructions about the user account, go to the camera's built-in help.

About the counting zone

The counting zone is the area where the counter detects people.

The counting zone is indicated by a transparent rectangle in the middle of the image. It should be aligned with the door threshold. A perspective box is created on top of the counting zone with the approximate height of a person. For each of the four sides of the perspective box, you set the counting direction.

Blue to green – When a person moves from blue to green, it gets counted as someone going in. Arrows indicate the direction.
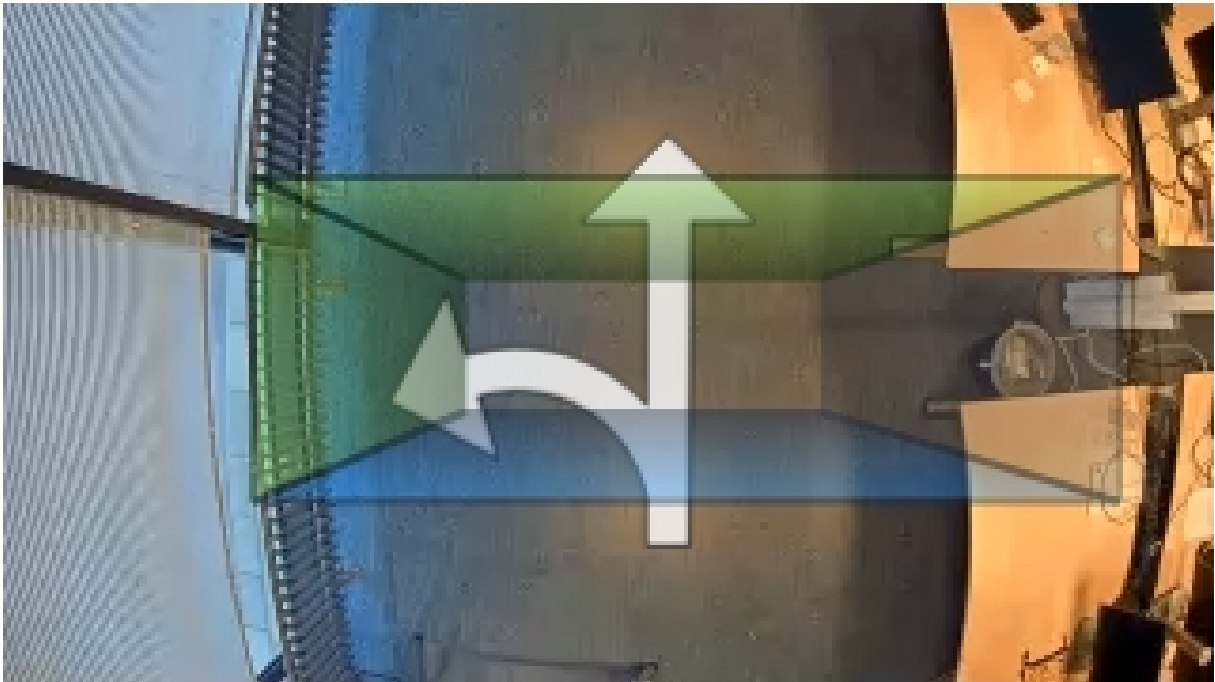
Green to blue – When a person moves from green to blue, it gets counted as someone going out.

For a person to be counted, they must move from blue to green or from green to blue. The feet must pass through the transparent rectangle in the middle.

To ensure the accuracy of the counter, you must calibrate and set up AXIS 3D People Counter before use. The setup is done in two steps:

- First, you need to calibrate the counter to be able to analyze the incoming data. You perform the initial calibration when you first connect to the application. See *How to calibrate the counter on page 12*.

- Second, you must adjust the counting zone to fit the scene. You do this in the settings page. See *How to set up the counter on page 14*.

How to calibrate the counter

During calibration, you must use the four paper markers included with the camera. Each marker is unique.

The markers are available *here*. If you print them yourself, use paper size A3/11x17 in (ledger/tabloid). Make sure the marker doesn't fill the page, as there must be a wide white margin on all sides for the calibration to work.

If there are any applications running on the camera, they are paused during the calibration.

1. Place one marker in each corner of the area visible through the camera. It doesn't matter which marker you place where.

Important

- Each marker is unique. Make sure to use different markers in each corner.
- The markers must be visible to the camera throughout the calibration process.
- If you need to fasten the markers to the floor, use transparent adhesive. If you use colored adhesive it can interfere with the calibration process.

Setup

2. In the application, you get to the initial calibration after the registration page. If you want to recalibrate the counter, go to **Maintenance > Calibration**.

3. Click **Calibrate**. The following happens:

    –   The application gathers data.

    –   The application processes the data. This usually takes 1 to 5 minutes.

    –   If the calibration is successful, ✅ is shown on top of each marker in the image. If ❌ is shown on top of a marker, it means the calibration failed because the markers are placed too close together. You need to move the markers and calibrate again.

4. When the calibration is done, click **Go to live view**.

Reasons for a failed calibration:

•   the markers are placed too close together

•   one or more markers are obscured

•   there are duplicate markers
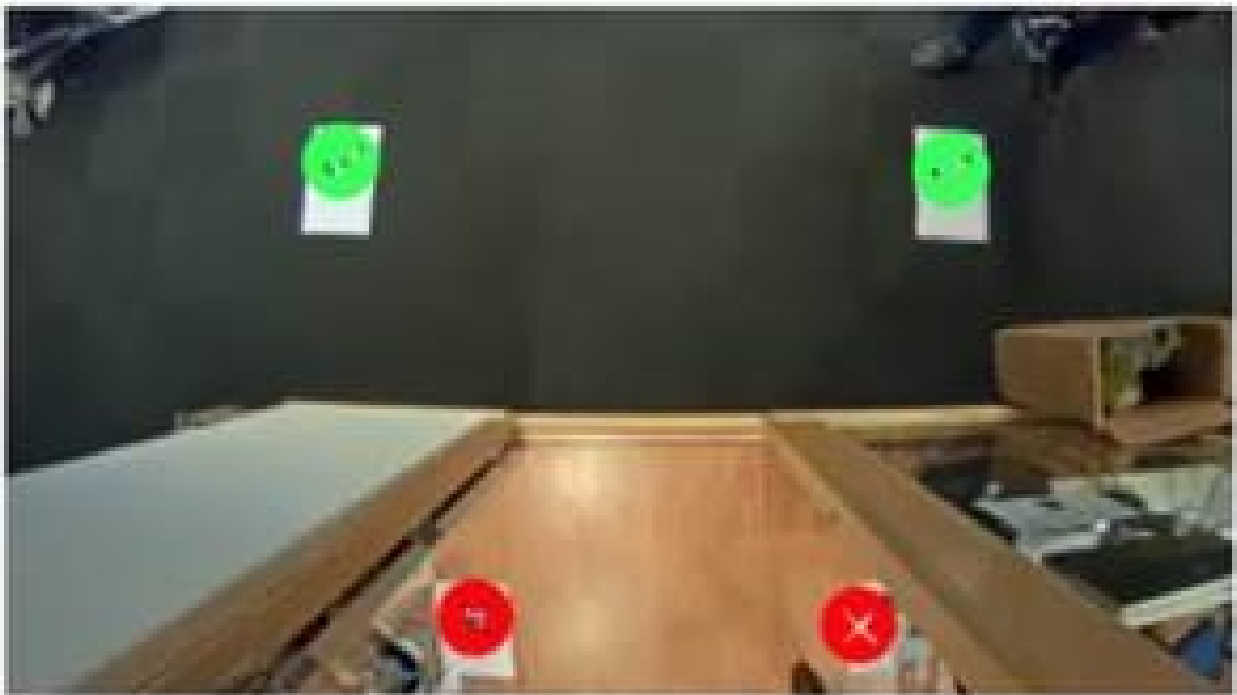
Example of a challenging calibration, where the two lower markers are placed too close together.

A solution to the challenging calibration is to place one marker in the center.

How to set up the counter

1. Measure the camera's mounting height. This is the distance from the floor to the bottom of the camera's lens.

    See *How to mount the camera on page 5* .

2. In the application's webpage, go to **Settings > General**.

3. In the **Name** field, type the name of the camera or location.

    This can be for example "Axis_Main_entrance_T_building". All cameras need to have unique names.

4. Enter the camera's mounting height in the **Mounting height (cm)** field.

5. Click **Submit**.

6. Go to **Settings > Counting area**.

7. Set **Top direction**, **Bottom direction**, **Right direction**, and **Left direction** to **In**, **Out**, or **None**, depending on the direction of the people passing by in live view. When you select **Out**, that side turns blue, and when you select **In**, that side turns green and is also indicated with an arrow.

Note

> The camera's mounting height affects both the width adjustment and the alignment of the counting area.

8. Align the counting area with the door threshold with the **Counting area offset** slider.

9. To adjust the width of the counting area, use the **Counting area width** slider.

AXIS 3D People Counter

About schedules

There are two types of schedules: automatic and manual. The automatic schedule turns off the application when there is insufficient lighting. This schedule is used by default. With a manual schedule, you can decide yourself at what times to turn the application on and off for each day of the week.

You can update the schedule settings under **Settings > Advanced > Schedule**.

How to anonymize people

Note

This setting is only available if you have logged in as an administrator.

If you want to prevent people from being identified in live view or recordings, you can turn on the anonymize feature. The anonymize feature blocks all video streams and images from the camera and turns live view into a black image.

How to turn on anonymize

1. Go to **Advanced > Anonymize**.

2. Click **Anonymize**.

How to turn off anonymize

1. To go back to normal mode, go to **Advanced > Anonymize**.

2. Click **Reset anonymization**.

How to validate the system

Note

Before you validate the system, make sure you have mounted the camera according to the recommendations. See *How to mount the camera on page 5* .

When you have installed and set up all cameras in the building, we recommend that you validate the accuracy and fine-tune the system. This is likely to increase the accuracy or identify any problems with the counters.

To get an overview, go to **Statistics** and look at the counting data for a couple of days back. If the difference between number of persons going in and out is <5% it's a good first indication that the system is configured correctly.

Important

- The validation only works if
    - there is only a single point of entry to the building, or
    - all points of entry to the building are covered by a counter and the statistics are aggregated, manually or with the help of AXIS Store Reporter, across all counters.

About the statistics

There are several ways to use the statistics from the counter:

- In the application's webpage, view real-time counting data in the built-in graphs.

- View built-in graphs in day and week view from the statistics page. The data is updated in real time.

  Data is available on the camera for up to 90 days and updated every minute. The data is stored in one-minute bins representing the in and out counts for that minute.

- View graphs of historical data directly on the camera.

- Download data through an open API.

- Use AXIS Store Data Manager, a software package that acts as a central point to store and manage data collected from all cameras. See *Connect a camera to a folder in AXIS Store Data Manager on page 17*.

- Use AXIS Store Reporter, a statistical web-based solution, for managing and monitoring historical data.

- Download statistics to your computer, see *How to download statistics on page 17*.

Connect a camera to a folder in AXIS Store Data Manager

To perform this task, the application must be installed on the camera.

1. In AXIS Store Data Manager, go to **Sources** and get the **Folder connection identifier** and the **Folder connection password** for the folder you want to connect to.

2. In the camera's webpage, go to **Setup > Application > AXIS 3D People Counter** and click the link.

3. In the application's webpage, go to **Settings > Reporting**.

4. To enable pushing data to a server, select **Enabled**.

5. Enter the web address for AXIS Store Data Manager, for example `https://[systemintegrator1].asdm.axis.com/datamanager` where `[systemintegrator1]` is replaced by a unique name.

6. Enter the **Folder connection identifier** and **Folder connection password**.

7. Click **Submit**.

How to download statistics

1. Go to **Statistics > Download statistics**.

2. Select the **File format**.

3. Select **Time interval**.

4. Select **Time period**.

5. Select start date and end date in the calendars.

6. Select **Retrieval method**.

7. Click **Export**. The browser saves the file in the default download folder.

If you want to download all available data, click **Download all** next to the file format.

Troubleshooting

If you can't find what you're looking for here, try the troubleshooting section at *axis.com/support*.

Issue	Action
The software does not count.	Make sure the instructions for how to mount the camera has been followed, see *How to mount the camera on page 5* .
I still cannot get the software to count.	If you have followed the advice above and still cannot get the software to work, contact your Axis reseller.
The software prompts me with a warning saying that the FPS is low.	1. Make sure no other applications run on the camera at the same time. 2. Make sure there is only one video stream from the camera running at a time.

How to restart the application

If the counting is inaccurate or the web interface unusually slow, you can try restarting the running services or restart the camera.

Go to **Maintenance > Restart**.

How to generate a log report

If you have any trouble with your camera you can generate a log report.

1. Go to **Maintenance > Logs**.

2. Click **Show logs**.

3. The log report opens in a new tab in the browser.

How to manage your license

Go to **Maintenance > Registration**.

- To register a license, click on the **Registration page**.

3D people counter API

3D people counter API

Common examples

Example

Open all statistics that are stored in the camera with a one minute resolution, using a browser.

Request (CSV)

```
http://<servername>/stereo/people-counter/export.csv?export-method=on&date=YYYYMMDD&resolution=60
```

See *List download statistics on page 19* for more information.

Example

Download statistics that occurred on the 10th of January of 2017.

Request (JSON)

```
http://<servername>/stereo/people-counter/export.json?resolution=day&date=20170110&method=downloa
```

See *List download statistics on page 19* for more information.

API specification

Request real-time data

Returns JSON file with real time counting data.

Request

```
http://<servername>/stereo/people-counter/counts.json
```

Return

```
{
  "in":  0,
  "name":  "Untitled AXIS 3D People Counter",
  "out":  0,
  "serial":  "ACCC8E235294",
  "timestamp":  "20180115121710"
}
```

Return value descriptions

Value	Description
in	Number of people passing in until now today.
name	The name of the application, chosen by the client.
out	Number of people passing out until now.
serial	The Mac address for the camera.
timestamp	Time in the camera in the format YYYYMMDDhhmmss.

List download statistics

Returns statistics stored in the camera in JSON or plain text comma separated format (CSV)

Request (CSV)

```
http://<servername>/stereo/people-counter/export.csv?resolution=<resolution>&date=<date>&method=<
```

AXIS 3D People Counter

3D people counter API

Request (JSON)
```
http://<servername>/stereo/people-counter/export.json?resolution=<resolution>&date=<date>&method=
```

Request parameter descriptions

Parameter	Description
<date>	a date of the form `YYYYMMDD`
	a date interval of the form `YYYYMMDD-YYYYMMDD`
	comma separated dates of the form `YYYYMMDD,[..],YYYYMMDD`
	`all` (default) for all available data
<resolution>	`minute` for data in 1 minute bins
	`hour` for data in 1 hour bins
	`day` for data in 1 day bins
	`60` for data in 1 minute bins
	`3600` for data in 1 hour bins
	`86400` for data in 1 day bins
<method>	select `open` to list the statistics in a web browser
	select `download` to download the JSON or CSV file

Return

Returns statistics stored in the camera in JSON or plain text comma separated format (CSV). The first line of the CSV file contains a description of each element, and the following lines contain the corresponding data for the chosen time interval and resolution:
`Interval Start, Interval Start (Unixtime), In, Out`

List frame rate

Returns the current internal frame rate

Request
```
http://<servername>/stereo/fps.json
```

Return
```
{
  "fps":  real time fps,
  "fps_100":  average FPS for the last 100 frames,
  "fps_1000":  average FPS for the last 1000 frames,
  "fps_5":  average FPS for the last 5 frames,
  "fps_50":  average FPS for the last 50 frames,
  "frames":  frame counter.
}
```

I/O interface

Get the latest I/O signals as `false` or `true`.

Request
```
http://<servername>/stereo/io.json
```

Return
```
"True" or "False"
```

List parameters

Get all parameters currently set.

Request
`http://<servername>/stereo/params.json`

Return

A JSON object of all the parameters currently set.